17 VIDEO SIGNAL PROCESSING

17.1 Purpose

To improve the quality of the video signal(s) by utilizing a variety of processing software.

17.2 Scope

Video analysis includes the application of various techniques in order to clarify the intelligibility and visual information recorded onto magnetic tape or various types of digital media. Certain inherent qualities of forensic video analysis prohibit the establishment of a rigid set of standard procedures to cover every case. Therefore, enough latitude has been given to allow for independent thought and freedom in the selection of alternative courses of action as it applies to the analysis of the evidence.

17.3 Materials-Equipment (Hardware/Software)

The following equipment and materials may be utilized and is up to the discretion of the examiner:

- Video recorders/players (consumer, professional and/or security time lapse)
- Multiplexers
- Time-base correctors
- Cell phones
- Other images storage devices
- Professional headphones
- Professional monitors
- Computer hardware and software
- Audio/Video cables (BNC, XLR, RCA, etc.)
- Printers and appropriate output media
- RAID systems utilized for storage

17.4 Limitations

None for this procedure

17.5 Safety

None for this procedure

17.6 Procedures

17.6.1 The evidence will be received in accordance with the Department's evidence handling procedures (see Section 20 of the Quality Manual).

17.6.2 Ensure preliminary examination has been conducted.

17.6.3 Ensure playback has been optimized.

17.6.4 Any device to prevent overwriting or recording will be enabled if the evidence is the original recording or a duplicate. Any items removed will be retained and returned with the original submitted evidence.

17.6.5 Apply the appropriate settings to the video signal processing equipment, if necessary. This may include, but is not limited to, levels gamma correction and image clarification.

17.6.6 If possible and if necessary, the examiner will determine if the evidence is the original recording or a duplicate. This can be determined by Investigator's description or other provided information.

17.6.7 The examiner will determine, if possible, the model and settings (recording format and speed) used to produce the original recording. If not possible, visual inspection or electronic analysis will be use to determine which available video recorder/player can provide the best output signal. If an adequate output signal cannot be produced, the case investigator will be contacted and the submission of the original recording device requested.

17.6.8 The area of interest on the evidentiary recording will be located using the selected equipment. The area of interest will be noted by using the date/time stamp on the recording, the player counter information, or other identifying information. If the date/time stamp is not visible, and the necessary decoding equipment is not available, a reasonable amount of recourses will be utilized in an attempt to locate the area of interest.

- Any action or equipment that may cause damage to the original recording is inappropriate and should not be utilized. Such actions may include, but are not limited to, maintaining the recording the pause mode for extended periods, unnecessarily repeated playback of the recording, or the proximity to strong magnetic fields.

17.6.9 The appropriate playback speed for the capture of the recording will be determined. A time-base corrector (TBC) may be used to stabilize the signal.

17.6.10 The area of interest will be captured in a video stream form with the use of a frame grabber hardware and software selected at the examiner's discretion. Notes of settings and other appropriate information will be recorded in the case notes to allow for adjustment of the input signal. All captured files will be captured and stored in an uncompressed format or another lossless compression format using the case number as the file name.

17.7 References

Owner's Manuals, User's Manuals and Training Manuals as well as appropriate software manuals should be referenced for equipment and operating instructions.

Inglis, Andrew F., and Arch C. Luther. Video Engineering. 2nd ed. New York: McGraw-Hill, 1996.

Madisetti, Vijay K., and Douglas B. Williams, eds. The Digital Signal Processing Handbook. N.p.: CRC Press LLC, 1998.

Whitaker, Jerry, and Blair Benson. Standard Handbook of Video and Television Engineering. 3rd ed. New York: McGraw-Hill, 2000.

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